Jared F. Miller

Convex Optimization · Nonlinear Systems · Control

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Education

Northeastern University   *Boston, MA, USA*

Ph.D. in Electrical and Computer Engineering   *Sept. 2018 - Present*

- Communications, Control, and Signal Processing (CCSP)
- Advised by Prof. Mario Sznaier
- Thesis Committee: Mario Sznaier, Octavia Camps, Bahram Shafai, Eduardo Sontag, Didier Henrion (LAAS-CNRS)
- GPA: 4.0 (4.0 Scale)
- Expected Graduation May 2023

M.S. in Electrical and Computer Engineering   *Sept. 2015 - May 2018*

- Communications, Control, and Signal Processing (CCSP)
- GPA: 3.852 (4.0 Scale)

B.S. in Electrical Engineering   *Sept. 2013 - May 2018*

- Minor in Mathematics
- GPA: 3.865 (4.0 Scale)

Research Publications

Journal Papers (published)

1. Jared Miller, Yang Zheng, Mario Sznaier, and Antonis Papachristodoulou. Decomposed structured subsets for semidefinite and sum-of-squares optimization. *Automatica*, 137:110–125, 2022
2. J. Miller, D. Henrion, and M. Sznaier. Peak Estimation Recovery and Safety Analysis. *IEEE Control Systems Letters*, 5(6):1982–1987, 2021
3. Jared Miller, Muhammad Ali Al-Radhawi, and Eduardo Daniel Sontag. Mediating Ribosomal Competition by Splitting Pools. *IEEE Control Systems Letters*, 5(5):1555–1560, 2021

Journal Papers (submitted)

1. Jared Miller and Mario Sznaier. Bounding the Distance to Unsafe Sets with Convex Optimization, 2021. arXiv: 2110.14047

Conference Proceedings (published)

1. Jared Miller, Didier Henrion, Mario Sznaier, and Milan Korda. Peak Estimation for Uncertain and Switched Systems. In *2021 60th IEEE Conference on Decision and Control (CDC)*, pages 3222–3228, 2021 (Outstanding Student Paper Award)
2. J. Miller, R. Singh, and M. Sznaier. MIMO System Identification by Randomized Active-Set Methods. In *2020 59th IEEE Conference on Decision and Control (CDC)*, pages 2246–2251, 2020
3. Jared Miller, Yang Zheng, Mario Sznaier, and Antonis Papachristodoulou. Decomposed Structured Subsets for Semidefinite Optimization. In *2020 21st IFAC World Congress*, 2020
4. Chieh Wu, Jared Miller, Yale Chang, Mario Sznaier, and Jennifer Dy. Solving Interpretable Kernel Dimensionality Reduction. In H. Wallach, H. Larochelle, A. Beygelzimer, F. d'Alché-Buc, E. Fox, and R. Garnett, editors, *Advances in Neural Information Processing Systems*, volume 32, pages 7915–7925. Curran Associates, Inc., 2019 (acceptance rate 21.9%)
5. J. Miller, Y. Zheng, B. Roig-Solvas, M. Sznaier, and A. Papachristodoulou. Chordal Decomposition in Rank Minimized Semidefinite Programs with Applications to Subspace Clustering. In *2019 IEEE 58th Conference on Decision and Control (CDC)*, pages 4916–4921, 2019
6. J. Miller and B. Shafai. A Model of Heave Dynamics for Bagged Air Cushioned Vehicles. In *2019 IEEE Conference on Control Technology and Applications (CCTA)*, pages 976–981, 2019
7. B. Taskazan, J. Miller, U. Inyang-Udoh, O. Camps, and M. Sznaier. Domain Adaptation Based Fault Detection in Label Imbalanced Cyberphysical Systems. In *2019 IEEE Conference on Control Technology and Applications (CCTA)*, pages 142–147, 2019

Conference Proceedings (submitted)

1. Jared Miller and Mario Sznaier. Facial input decompositions for robust peak and reachable set estimation under polyhedral uncertainty, 2021. arXiv: 2112.14838
2. Jared Miller and Mario Sznaier. Bounding the Distance of Closest Approach to Unsafe Sets with Occupation Measures, 2022

Seminars

1. "Bounding distances to unsafe sets", June 28, 2021, Brainstorming days on measure and polynomial optimization (BrainPOP), LAAS-CNRS.
2. "Data-Driven Peak and Reachability Set Estimation", May 25, 2021, MS112 Methods of Learning Dynamical Systems for Control, SIAM Conference on Dynamical Systems.
3. "Analysis and Control of Time-Delay Systems with Occupation Measures", May 3, 2021, BrainPOP, LAAS-CNRS.
4. "Exploiting Structure in Rank-Constrained and Approximated Semidefinite Programs", December 19, 2019, TISEM Operations Research Seminar, Tilburg University.

Poster Sessions (without Conference Proceedings)

1. "Exploiting SDP Structure Yields Tighter Approximations." April 9, 2020. RISE, Northeastern University (remote).
2. "Exploiting SDP Structure Yields Tighter Approximations." February 24, 2020. IPAM Control, Learning and Optimization workshop, University of California, Los Angeles.
3. "Chordal Decompositions in Rank Minimized SDPs." May 30-31, 2019. Learning for Decision and Control (L4DC), Massachussets Institute of Technology.
4. "Chordal Decompositions in Rank Minimized SDPs." May 10, 2019. New England Machine Learning Day, Northeastern University.
5. "Scattered data interpolation through B-spline wavelets and the Elastic Net." April 14, 2017. RISE, Northeastern University.
6. "A parallelized Python-based Multi-Point Thomson Scattering analysis in NSTX-U." October 29, 2014. 56th Annual APS Plasma Physics Conference, New Orleans.

Experience

Northeastern University
Boston, MA, USA

Research Assistant, Robust Systems Lab, Controls Group
Jul. 2017 - Present

Laboratory for Analysis and Architecture of Systems (LAAS-CNRS)
Toulouse, FR

Chateaubriand Fellow, Decision and Optimization, Methods and Algorithms in Control (MAC) Team
Jan. 2022 - Present

Paradigm Hyperloop
Boston, MA, USA

Control Theorist, Levitation Group
Jul. 2017 - Dec. 2017

ASML Holding
Veldhoven, NL

Co-op, Metrology Group
Mar. 2016 - Aug. 2016

Advanced Micro Devices (AMD)
Boxborough, MA, USA

Co-op, Shader Compiler Group
Jan. 2015 - Jun. 2015

Princeton Plasma Physics Laboratory (PPPL)
Plainsboro Township, NJ, USA

Intern/Part-time Contractor, Data Visualization Group
Sep. 2012 - Feb. 2016

Cornell High Energy Synchrotron Source (CHESS)
Ithaca, NY, USA

Summer Intern/Research Assistant
Jul. 2012 - Aug. 2012

Honors & Awards

Jan. 2022 **Travel Award (for Toulouse),** AFOSR FY22 International Student Exchange Program (ISEP)		*Arvada, CO, USA*
Dec. 2021 **Outstanding Student Paper Award,** 2021 60th Conference on Decision and Control		*Austin, TX, USA*
Apr. 2020 **Chateaubriand Fellowship,** Office of Science and Technology, Embassy of France in the USA		*Toulouse, FR*
Feb. 2020 **Hosting,** IPAM: Intersections between Control, Learning and Optimization (UCLA Workshop)		*LA, CA, USA*
Dec. 2019 **Travel Award for Seminar,** TISEM Seminar at Tilburg University		*Tilburg, NL*
Aug. 2019 **Travel Award,** 2019 IEEE Conference on Control Technology and Applications (CCTA)		*Hong Kong*
2013-2018 **Honors Program,** Northeastern University		*Boston, MA, USA*
2015-2018 **Dean's List,** Northeastern University		*Boston, MA, USA*

Skills

Programming	Matlab (incl. Simulink), Python, Mathematica, LaTeX, Julia, C/C++
MS Office	Word, Excel, PowerPoint, Publisher

Teaching

Northeastern University   *Boston, MA, USA*

Teaching Assistant

- EECE 7345: Big Data, Sparsity, and Control (Fall 2021)

Professional Organizations

Institute of Electrical and Electronics Engineers (IEEE)

(Graduate) Student Member   *Sept. 2013 - Present*

IEEE Eta Kappa Nu (HKN)

Member   *Sept. 2014 - Present*

Society for Industrial and Applied Mathematics

Member   *Oct. 2019 - Present*

Professional Service

Reviewer

Automatica, IEEE TAC, IEEE L-CSS, L4DC, ROCOND, CDC, Nonlinear Analysis: Hybrid Systems